

Quiz 8

NAME: _____

Question 1

Let the vector field $F = (1, z + x, y)$.

Let the triangle T in (x, y, z) -space consist of the points in the first octant satisfying equation $\frac{x}{2} + \frac{y}{3} + z = 1$ (i.e., the points satisfy the equation plus the inequalities $x \geq 0, y \geq 0, z \geq 0$).

(a) Set up as a double integral ready to evaluate (but do *not* evaluate) this surface integral, where T is oriented by the normal pointing in the direction opposite from the origin, i.e, upward orientation.

$$\iint_T \text{curl } F \cdot n \, dS$$

Note: The answer should be a “plain vanilla” double integral, with no vector stuff at all left in it.

Question 2

For the same F and T , use Stokes’ Theorem to write a line integral that will be equal to the surface integral above. Again, in this case, write the integral as an integral (or sum of integrals) ready to evaluate (but do *not* evaluate).

Note: The answer should be a “plain vanilla” single integral, with no vector stuff at all left in it. This answer may have multiple parts, so write neatly and clearly so that your answer can receive full credit. If you need an extra sheet of paper, just ask.